

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE  
BOARD OF PATENT APPEALS AND INTERFERENCES**

**APPELLANT:** Colson et al.  
**SERIAL NO.:** 09/869,941  
**FILED:** 04 January 2002  
**FOR:** Non Woven Fabric and Method and Apparatus for  
Manufacturing Same  
**EXAMINER:** Befumo, J.L.  
**GROUP:** 1771

Board of Patent Appeals and Interferences  
P.O. Box 1450  
Alexandria, VA 22313-1450

**AMENDED APPEAL BRIEF UNDER 37 C.F.R. §1.192**

This submission is in response to the Notification of Non-Compliant Appeal Brief dated March 3, 2006, which was received on March 15, 2006. The deadline for filing this Amended Appeal Brief is April 3, 2006. The revisions provided herein follow 37 C.F.R. 41.37(c)(1) and MPEP Section 1205.02.

**Introduction**

Appellant respectfully appeals the decision of Examiner Befumo dated July 28, 2005, and reaffirmed in an Advisory Action dated November 14, 2005, finally rejecting claims 158-199, i.e., all of the claims remaining in the present application. This appeal is directed to these claims.

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**(i) Real party in interest:**

The real party in interest in this appeal is Hunter Douglas, Inc., the assignee of the subject application.

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**(ii) Related appeals and interferences:**

Appellant hereby confirms that there are no related prior or pending appeals and/or interferences regarding this application. Likewise, there are no prior or pending related judicial proceedings. Appellant has filed a continuation application, now pending as U.S.S.N. 11/352,551.

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**(iii) Status of claims:**

Claims 158-199 are being appealed. The status of all claims filed in this application is as follows:

1-157. (Cancelled).

158. (Rejected) A nonwoven fabric comprising:  
a first layer of substantially parallel first yarns; and  
a second layer of substantially parallel second yarns;  
the first and second yarns being substantially perpendicular to one another and the first and second layers being adhered together with an adhesive, wherein:

- (a) the adhesive is applied to one side of the first layer of substantially parallel yarns in a discontinuous manner;
- (b) the adhesive forms random bridges between substantially parallel yarns of the first layer; and
- (c) the adhesive is located substantially only between the first and second layers of the adhered together substantially perpendicular yarns.

159. (Rejected) The nonwoven fabric of claim 158, wherein the adhesive is on only one side of the first yarns.

160. (Rejected) The nonwoven fabric of claim 159, wherein the substantially parallel first yarns in the first layer are held together to form a sheet by the bridges of the adhesive which prevent twisting of the individual first yarns in the first layer.

161. (Rejected) The nonwoven fabric of claim 159, wherein the adhesive is on the one side of the first yarns at a level of from about 5 weight percent to about 25 weight percent, based upon the total weight of the sheet of the first yarns.

162. (Rejected) The nonwoven fabric of claim 161, wherein the total weight of the sheet of the first yarns is about  $50 \text{ g/m}^2$  and the adhesive weight is about 2 to  $15 \text{ g/m}^2$ .

163. (Rejected) The nonwoven fabric of claim 161, wherein the total weight of the sheet of the first yarns is about  $50 \text{ g/m}^2$  and the adhesive weight is about 5 to  $10 \text{ g/m}^2$ .

164. (Rejected) The nonwoven fabric of any one of claims 158-163, wherein the first yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite.

165. (Rejected) The nonwoven fabric of claim 164, wherein the polymer fibers are selected from the group consisting of polyester, polyethylene, rayon, polypropylene and nylon fibers.

166. (Rejected) The nonwoven fabric of claim 164, wherein the natural fibers are selected from the group consisting of cotton fibers and wool fibers.

167. (Rejected) The nonwoven fabric of claim 164, wherein the metal fibers are selected from the group consisting of copper, gold, aluminum, silver and platinum.

168. (Rejected) The nonwoven fabric of claim 164, wherein one or more of the first yarns are glass fibers.

169. (Rejected) The nonwoven fabric of any one of claims 158-163, wherein the substantially parallel first yarns have been formed in a warp-direction and supported and bonded on only one side by the adhesive.

170. (Rejected) The nonwoven fabric of claim 169, wherein the adhesive has been applied to the first yarns by dip/nip saturation, spraying, gravure coating, or kiss coating.

171. (Rejected) The nonwoven fabric of claim 170, wherein the adhesive has a thickness of about 0.25 mil to about 1 mil.

172. (Rejected) The nonwoven fabric of claim 170, wherein the adhesive is a heat activatable adhesive.

173. (Rejected) The nonwoven fabric of claim 172, wherein the adhesive is a hot melt adhesive.

174. (Rejected) The nonwoven fabric of claim 173, wherein the adhesive is a hot melt copolyester polymer.

175. (Rejected) The nonwoven fabric of claim 170, wherein the adhesive is a scrim or lace web of adhesive or a meltblown adhesive.

176. (Rejected) The nonwoven fabric of any one of claims 158-163, wherein the adhesive is from about 5 to 20 percent by weight of the total weight of the fabric.

177. (Rejected) The nonwoven fabric of claim 176, wherein the adhesive is from about 10 to 15 percent by weight of the total weight of the fabric.

178. (Rejected) The nonwoven fabric of any one of claims 158-163, wherein the second yarns extend at an angle of about 80 degrees to about 89.7 degrees relative to the first yarns.

179. (Rejected) The nonwoven fabric of claim 178, wherein the second yarns extend at an angle of about 85 to about 89.7 degrees relative to the first yarns.

180. (Rejected) The nonwoven fabric of any one of claims 158-163, wherein the first yarns are equally spaced apart and the second yarns are equally spaced apart.

181. (Rejected) The nonwoven fabric of any one of claims 158-163, wherein the first layer and/or the second layer has a density of at least 40 yarns per inch in a transverse direction of the yarns.

182. (Rejected) The nonwoven fabric of claim 181, wherein the first layer and/or the second layer has a density of between 40 and 140 yarns per inch in a transverse direction of the yarns.



183. (Rejected) The nonwoven fabric of claim 182, wherein the first layer and/or the second layer has a density of between 60 and 100 yarns per inch in a transverse direction of the yarns.

184. (Rejected) The nonwoven fabric of claim 183, wherein the first layer has a density of 40 to 90 yarns per inch of 30/1 to 36/1 count yarn.

185. (Rejected) The nonwoven fabric of claim 183, wherein the second layer has a density of 90 to 140 yarns per inch of 36/1 count yarn.

186. (Rejected) The nonwoven fabric of claim 164, wherein the second yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite.

187. (Rejected) The nonwoven fabric of claim 186, wherein the polymer fibers are selected from the group consisting of polyester, polyethylene, rayon, polypropylene and nylon fibers.

188. (Rejected) The nonwoven fabric of claim 186, wherein the natural fibers are selected from the group consisting of cotton fibers and wool fibers.

189. (Rejected) The nonwoven fabric of claim 186, wherein the metal fibers are independently selected from the group consisting of copper, gold, aluminum, silver and platinum.

190. (Rejected) The nonwoven fabric of claim 186, wherein one or more of the second yarns are glass fibers.

191. (Rejected) The nonwoven fabric of claim 186, wherein one or more of the first yarns are spun polyester yarns.

192. (Rejected) The nonwoven fabric of claim 186, wherein one or more of the second yarns are single strand cotton yarns.

193. (Rejected) The nonwoven fabric of claim 169, wherein the second yarns have been formed in a weft-direction and a side of the second yarns are supported by, and adhered to, the one side of the first yarns by the adhesive, applied to only the one side of the first yarns.

194. (Rejected) The nonwoven fabric of claim 193 which has a weft-direction strength equal to its warp-direction strength.

195. (Rejected) The nonwoven fabric of claim 193, wherein the denier of all the first and second yarns is approximately the same.

196. (Rejected) The nonwoven fabric of claim 193, wherein the denier of some of the first yarns is different and/or the denier of some of the second yarns is different.

197. (Rejected) The nonwoven fabric of claim 193, wherein the denier of all the first yarns is the same and the denier of all the second yarns is the same.

198. (Rejected) The nonwoven fabric of claim 193, wherein the denier of the first yarns is different from the denier of the second yarns.

199. (Rejected) The nonwoven fabric of claim 193, wherein some of the second yarns are of a smaller denier than the first yarns.

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**(iv) Status of amendments:**

Appellant filed a response to the Final Rejection on 26 October 2005, in which Claim 158 was amended. None of the other claims were amended in this response. In the Advisory Action dated 14 November 2005, the amendment was entered for purposes of appeal.

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**(v) Summary of claimed subject matter:**

Claims 158-199 are on appeal herein. All of the claims on appeal depend either directly or indirectly from Claim 158, reproduced here:

158. A nonwoven fabric comprising:

a first layer of substantially parallel first yarns; and

a second layer of substantially parallel second yarns;

the first and second yarns being substantially perpendicular to one another and the first and second layers being adhered together with an adhesive, wherein:

(a) the adhesive is applied to one side of the first layer of substantially parallel yarns in a discontinuous manner;

(b) the adhesive forms random bridges between substantially parallel yarns of the first layer; and

(c) the adhesive is located substantially only between the first and second layers of the adhered together substantially perpendicular yarns.

Claim 158 clearly recites several distinctive features of the claimed nonwoven fabric, namely:

(1) parallel first yarns (e.g., warp yarns);

(2) parallel second yarns (e.g., weft yarns);

(3) wherein the first and second yarns are substantially perpendicular and bound by adhesive; and wherein:

(4) the adhesive is applied to one side of the first yarns in a discontinuous manner;

(5) the adhesive forms random bridges between the parallel first yarns; and

(6) the adhesive is located substantially only between the layers of the first and second yarns.

These features are best illustrated in Figures 61A and 61B of the application, a portion of each shown below.

In Figure 61A we see the side of the fibers which includes the discontinuous adhesive and shows the adhesive bridges between the substantially parallel yarns. A color version of this Figure is provided in the Evidence Appendix. There the adhesive appears as a golden colored material on the parallel fibers.

In Figure 61B we see the opposite side of the fibers – showing essentially no adhesive coating, but the random adhesive bridges on the opposite side are visible between the substantially parallel yarns. A color version of this Figure is also provided in the Evidence Appendix. There we see that some of the golden colored adhesive has come around the fibers and we also see the random bridges of adhesive between parallel fibers.

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From Fig. 61A:



From Fig. 61B:





Support for these claim limitations comes from the specification as filed, e.g., at paragraph no. [0129]:

[0129] One preferred nonwoven fabric of the present invention has parallel yarns held in a substantially parallel and nontwisting relationship in the form of a nonwoven, fabric-like sheet. Such materials are referred to herein as warp yarn substrates, and two manufacturing units for the formation of such substrates have been developed. In each case, adhesive is applied to one side of the parallel yarns. The adhesive is advantageously applied in a random pattern, forming bridges of adhesive between parallel yarns. These adhesive bridges provide the backbone of the warp yarn substrate, giving it fabric-like flexibility and feel. The bridges also hold the parallel positioning of the fibers and prevent twisting of individual fibers.

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**(vi) Grounds of rejection to be reviewed on appeal:**

Five rejections have been maintained by the Examiner:

**Rejection No. 1:**

Claims 158-160, 164, 169, 170, 178-180, 186, and 193-199 have been rejected under 35 U.S.C. §102(b) as being anticipated by Bascom (U.S. 3,582,443).

**Rejection No. 2:**

Claims 158-160, 164, 165, 169, 170-173, 178-180, 186, 193, 197, and 198 have been rejected under 35 U.S.C. §102(b) as being anticipated by Harwood (U.S. 2,900,980).

**Rejection No. 3:**

Claims 158-167, 169-189, and 192-199 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hartstein (U.S. 3,591,434) in view of Bodford et al. (U.S. 5,342,469).

**Rejection No. 4:**

Claims 168, 190 and 191 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hartstein (U.S. 3,591,434) in view of Bodford et al. (U.S. 5,342,469) and further in view of Pittman (U.S. 3,753,842).

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**Rejection No. 5:**

Claims 161-163, 165-168, 171-174, 176, 177, 181-185 and 187-192 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Bascom (U.S. 3,582,443).

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**(vii) Argument:**

**Rejection No. 1:**

**Section 102(b) rejection over U.S. 3,582,443:**

Claims 158-160, 164, 169, 170, 178-180, 186, and 193-199 have been rejected under 35 U.S.C. §102(b) as being anticipated by Bascom (U.S. 3,582,443). Reversal of this rejection is respectfully requested.

The following comments apply to each of the rejected claims, which are further argued individually below. Appellant respectfully submits that these claims are NOT to be considered as a group herein, and that each claim is patentable individually for the reasons set forth here an as set forth below. Accordingly, the following comments relate to each of the rejected claims, but are provided here once for the Board's consideration. Appellant further argues each claim separately, below. Accordingly, each claim must be considered on its own merits.

**General arguments against the Section 102(b) rejection of each of the claims:**

Anticipation requires identity of invention. Bascom does not anticipate any of the rejected claims because Bascom neither teaches nor suggests the claimed non-uniform, i.e., discontinuous, random bridges of adhesive applied to the first layer of yarns, as recited in the amended claim, which carries through to the claims that depend either directly or indirectly with Claim 158.

Instead, Bascom teaches a "continuous" or uniform adhesive coating, applied to either one set of the perpendicular yarn sets, or to both yarn sets. More particularly,

Bascom discloses a process of making non-woven fabrics by applying adhesive essentially only between warp-direction fibers WS and weft-direction fibers CS. See column 7, lines 32-35 and column 9, lines 57-61. The processes described by Bascom requires highly controlled application of adhesive to selected individual warp strands and/or selected individual cross strands, with other of the warp and cross strands remaining free of adhesive. See Col. 1, line 69 – Col. 2, line 30:

In the present invention a group of warp strands are assembled in a desired disposition and overlaid with a group of cross or fill strands after adhesive has been applied to one or both sets of strands. Heat and pressure applied for a period of time cause the two layers of fibers to adhere to one another.

The warp strands, under a controlled tension, are stabilized laterally and vertically by a pair of radially spaced, reversely curved arcs effective to turn the warp strands through two steep angles. In a preferred mode, each angle may be about 90°. As a result, the warp strands passing through the two arcs are stably retained in the lowermost portions of the curves and are precisely positioned at the outlet of the second arc.

Cross or fill strands are engaged with the warp strands at the outlet of the second arc under a controlled pressure. Both strands are supported on a series of closely spaced upstanding edges which aid scavenging of adhesive. The edges are inclined at an angle to both the warp and fill strands to facilitate movement of the strands over the edges and to produce scavenging of adhesive by movement of the adhesive down the groove until it is picked up in the fabric. The edges are spaced to give adequate line support to the strands.

The cross strands are fed from rotating magazines which contain reservoirs for the adhesive. The cross strands, before being laid on the warp strand, has a closely controlled amount of adhesive applied on the side immediately adjacent the warp strands, and substantially all adhesive is removed from the other areas of the cross strand. Adhesives can also be applied to selected warp strands in closely controlled quantities on the sides facing the cross strands to thereby produce a bi-directional fabric having equal strength in both directions.

These features of the Bascom invention are illustrated in the Figures, particularly Figs. 14A, 14B, 14C, 14D, 15 and 16, shown below:

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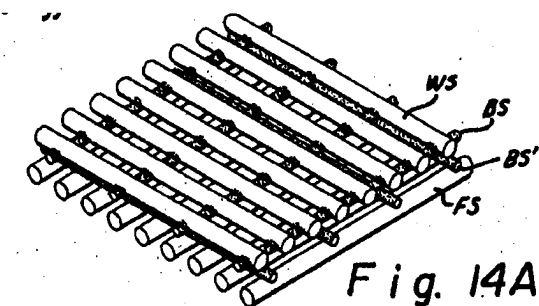


Fig. 14A

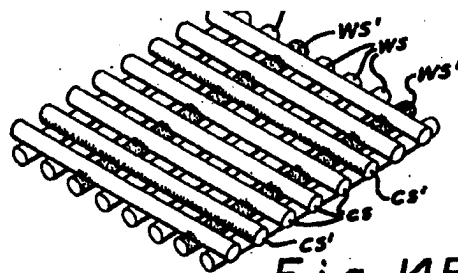


Fig. 14B

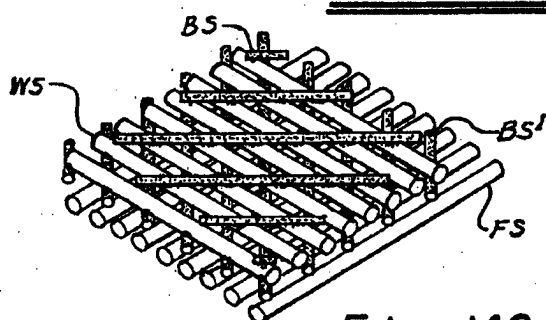


Fig. 14C

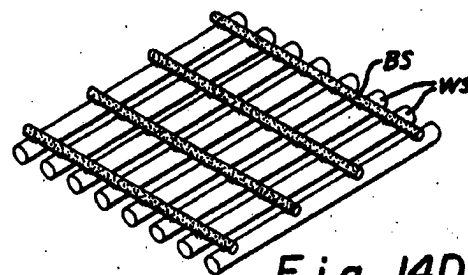


Fig. 14D

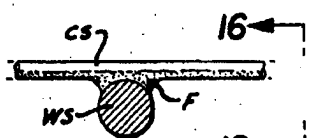


Fig. 15



Fig. 16

INVENTOR  
**Hollis H. Bascom**  
BY *Fryer & Spensholt*  
Attorneys

Since nothing is taught or suggested about adhesive bridges that randomly contact parallel yarns of the first layer of parallel yarns as claimed herein, Bascom clearly fails to anticipate the rejected claims.

In the Advisory Action, the Examiner admits that the presently claimed invention is "a composite structure having a first of parallel yarns and a second set of parallel yarns, the two sets of yarns run perpendicular to each other, with a discontinuous layer of adhesive between the two layers." This is correct – and the prior art cited against this invention does not teach or make obvious this claimed invention.

The Examiner's comments regarding what happens to the bridges upon heating (e.g., "the bridges will melt and form bonds between the two sets of parallel yarns") are irrelevant to the patentability of the claimed invention – which recites NOTHING about heating. The bridges are, at the very least, a feature of an **intermediate product** – which the present inventors are entitled to claim. Support for this product is found in the specification as filed:

In Paragraph No. [0188], the specification provides the following information:

If desired, the bond between the warp yarns and weft yarns can be made more intimate, for example by heating and cooling the product under pressure, e.g., by a lamination apparatus.

In Paragraph No. [0205], the specification teaches that the presently claimed composite fabric, formed by the XD machine, is subsequently fed to a flat bed laminator – which is where the adhesive is further melted and the crossed-yarns are pressed together:

The heating zone melts the adhesive between the fabric layers and causes the adhesive bridges to flow and spread between the layers of fabric.

These two statements clearly show that the presently claimed nonwoven fabric, with bridges of adhesive, exists as a separate intermediate product – and shows that the adhesive bridges are still between the yarns of the fabric before any further processing is conducted, for example, in the flat bed laminator. Moreover, this statement implies that the flat bed laminator leaves, at least partially intact, the claimed bridges of adhesive between the warp yarns while also melting these bridges somewhat, so that they flow and



spread (e.g., to the weft yarns). Nothing in the Examiner's question regarding the bridges refutes this point. The bridges are present, between the fabric layers – making this product both novel and unobvious compared to the products defined by the cited prior art, either considered individually or in any of the combinations proposed by the Examiner.

Given that the pending claims cover a product that exists – the product, and the claimed directed thereto are entitled to patent protection. Nothing in the claim language requires melting of the adhesive. The rejection should be reversed.

**Specific Individual Claim Arguments:**

**Claim 158:**

As set forth above, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this Independent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 159:**

This dependent claim adds the further detail to Claim 158 the adhesive is on only one side of the first yarns. Again, Bascom fails to teach all of the elements recited. Even though Bascom shows adhesive on one side of yarns, there are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 160:**

This dependent claim adds the further detail to Claim 159 that the substantially parallel first yarns in the first layer are held together to form a sheet by the bridges of the adhesive which prevent twisting of the individual first yarns in the first layer. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 164:**

This dependent claim adds the further detail to Claims 158-163 that the first yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 169:**

This dependent claim adds the further detail to Claims 158-163, wherein the substantially parallel first yarns have been formed in a warp-direction and supported and bonded on only one side by the adhesive. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this

dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 170:**

This dependent claim adds the further detail to Claim 169, wherein the adhesive has been applied to the first yarns by dip/nip saturation, spraying, gravure coating, or kiss coating. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 178:**

This dependent claim adds the further detail to Claim 169, wherein the adhesive has been applied to the first yarns by dip/nip saturation, spraying, gravure coating, or kiss coating. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 179:**

This dependent claim adds the further detail to Claim 178, such that the second yarns extend at an angle of about 85 to about 89.7 degrees relative to the first yarns.

Claim 178 depends from Claim 169, which depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 180:**

This dependent claim adds the further detail to Claims 158-163, wherein the first yarns are equally spaced apart and the second yarns are equally spaced apart. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 186:**

This dependent claim adds the further detail to Claim 164, such that the second yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite. Claim 164 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 193:**

This dependent claim adds the further detail to Claim 169, wherein the second yarns have been formed in a weft-direction and a side of the second yarns are supported by, and adhered to, the one side of the first yarns by the adhesive, applied to only the one side of the first yarns. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 194:**

This dependent claim adds the further detail to Claim 193 which has a weft-direction strength equal to its warp-direction strength. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 195:**

This dependent claim adds the further detail to Claim 193, wherein the denier of all the first and second yarns is approximately the same. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 196:**

This dependent claim adds the further detail to Claim 193, wherein the denier of some of the first yarns is different and/or the denier of some of the second yarns is different. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 197:**

This dependent claim adds the further detail to Claim 193, wherein the denier of all the first yarns is the same and the denier of all the second yarns is the same. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 198:**

This dependent claim adds the further detail to Claim 193, wherein the denier of the first yarns is different from the denier of the second yarns. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the

cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 199:**

This dependent claim adds the further detail to Claim 193, wherein some of the second yarns are of a smaller denier than the first yarns. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Bascom fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

For the foregoing reasons, Appellant respectfully submits that reversal of the Section 102(b) rejection of Claims 158 -160, 164, 169, 170, 178-180, 186, and 193-199 is proper.

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**Rejection No. 2:**

**Section 102(b) rejection over U.S. 2,900,980:**

Claims 158-160, 164, 165, 169, 170-173, 178-180, 186, 193, 197, and 198 have been rejected under 35 U.S.C. §102(b) as being anticipated by Harwood (U.S. 2,900,980). Reversal of this rejection is respectfully requested.

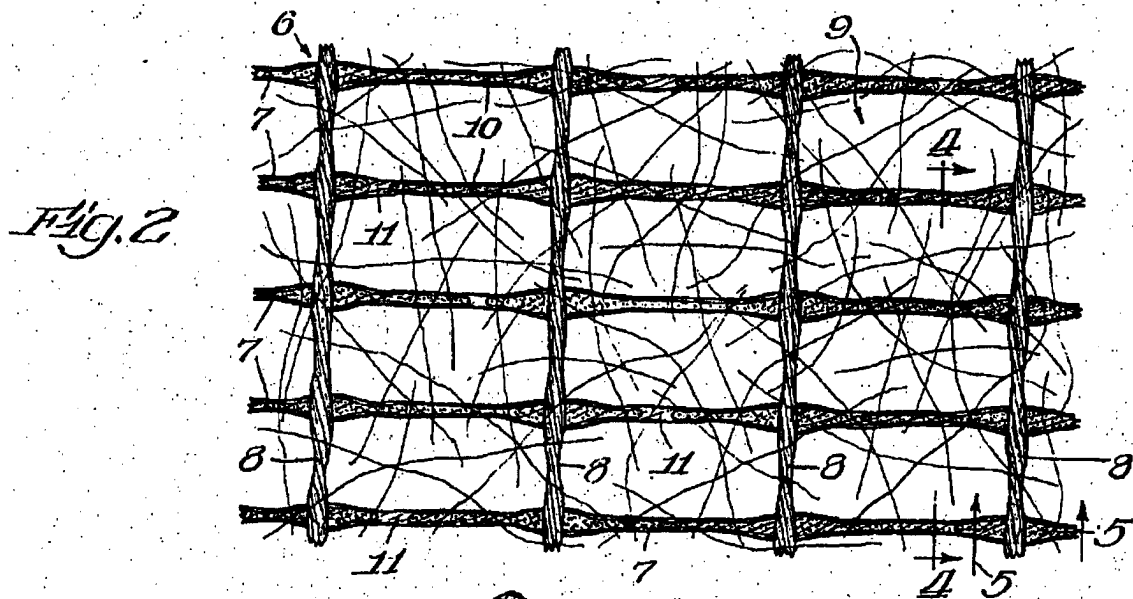
The following comments apply to each of the rejected claims, which are further argued individually below. Appellant respectfully submits that these claims are NOT to be considered as a group herein, and that each claim is patentable individually for the reasons set forth here an as set forth below. Accordingly, the following comments relate to each of the rejected claims, but are provided here once for the Board's consideration. Appellant further argues each claim separately, below. Accordingly, each claim must be considered on its own merits.

**General argument against the Section 102(b) rejection of each of the claims:**

As above, anticipation requires identity of invention. Harwood does not anticipate the rejected claims because Harwood does not teach each of the elements recited in Claim 158. Harwood specifically fails to teach or suggest the claimed feature defined above as (5) – namely that the adhesive forms random bridges between the parallel first yarns.

Harwood does teach the use of discontinuously applied adhesive on one side of the first layer of substantially parallel yarns. See the intentional gaps of missing adhesive (11) on threads (7) in Figure 2, shown below:





Instead of “adhesive bridges” as claimed herein, Harwood adds another fabric for support of parallel yarns – an applique (shown above as “9”). Harwood’s invention is taught more particularly at Col. 3, line 33 to Col. 4, line 20, reproduced below:

The wrapper 2 of the napkin is formed of a cross-laid thread backing or carrier web 6 comprising a series of spaced, substantially parallel lengthwise extending threads 7 and a series of spaced, substantially parallel crosswise extending threads 8, and an applique 9 of fibers. The threads 8, in this instance, are disposed substantially perpendicularly to the threads 7 so as to resemble woven gauze, and said threads 8 are adhesively bonded to said threads 7 by adhesive 10 on the threads 7, said adhesive serving to also bond said fiber applique to the thread-formed web. If desired, the cross-laid threads 7 and 8 may be disposed diagonally of the length of the web so as to present a diamond network pattern, and there may be one or more additional sets of threads cross-

laid on those illustrated, the threads of such additional sets being disposed at angles to the threads of both of said other sets. Parallel thread arrangement is not essential and may give way to non-parallel threads including various arrangements such as sets of wavy or undulating threads which threads may extend in one general direction without necessarily being parallel to one another.

The adhesive 10 on the threads 7 is preferably applied so as to be discontinuous along the lengths of said threads, irregularly spaced breaks or interruptions in said adhesive being indicated at 11. The cross threads 8 will seldom engage adhesive-free areas on adjacent lengthwise threads so that said cross threads will, notwithstanding said adhesive-free lengths, become effectively bonded to the adhesive-bearing threads. The cross threads are caused to engage adhesive bearing areas of the lengthwise threads with sufficient intimacy to insure adhesive interbonding of said lengthwise and crosswise threads, and calendering of the web may be employed to increase or amplify such intimacy. Due to this adhesive inter-bonding of the lengthwise and crosswise threads it is very practicable to-produce stable cross-laid thread webs having such open mesh construction as 4 x 4. The example represented in Figure 2 of the drawing is 10 x 5 construction, Figure 2 being greatly enlarged.

The fiber applique 9 may consist of natural or synthetic fibers or mixtures thereof and said fibers may be deposited in a more or less haphazard arrangement as represented in Figure 2 so that some, if not most, of the fibers will engage at least one adhesively coated thread portion so as to be thereby directly adhesively attached to the thread web. The fibers which form the applique 9 also have a normal tendency to cling to engaged thread portions even in the absence of adhesive so that an important degree of cohesion exists between the fibers and the engaged portions of the adhesive-free cross threads 8. Furthermore,

intertwining of the fibers in the applique also serves to anchor fibers to fibers so that a fiber which happens to miss engagement with any thread of the thread web may nevertheless be anchored thereto through the agency of other fibers which are directly attached to the thread web. Carded and similar fiber webs may also be employed to form the fiber applique. The fiber applique may be preformed and applied to the backing web or the applique may be formed on the backing web by depositing thereon fibers discharged in unmatted or free condition from air-laying, carding, and other forms of free fiber delivering apparatus.

Since nothing is taught or suggested about adhesive bridges that randomly contact parallel yarns of the first layer of parallel yarns as claimed herein, Harwood clearly fails to anticipate the rejected claims.

In the Advisory Action, the Examiner admits that the presently claimed invention is “a composite structure having a first of parallel yarns and a second set of parallel yarns, the two sets of yarns run perpendicular to each other, with a discontinuous layer of adhesive between the two layers.” This is correct – and the prior art cited against this invention does not teach or make obvious the claimed invention.

The Examiner’s comments regarding what happens to the bridges upon heating (e.g., “the bridges will melt and form bonds between the two sets of parallel yarns”) are irrelevant to the patentability of the claimed invention – which recites NOTHING about heating. The bridges are, at the very least, a feature of an **intermediate product** – which the present inventors are entitled to claim. Support for this product is found in the specification as filed:

In Paragraph No. [0188], the specification provides the following information:

If desired, the bond between the warp yarns and weft yarns can be made more intimate, for example by heating and cooling the product under pressure, e.g., by a lamination apparatus.

In Paragraph No. [0205], the specification teaches that the presently claimed composite fabric, formed by the XD machine, is subsequently fed to a flat bed laminator – which is where the adhesive is further melted and the crossed-yarns are pressed together:

The heating zone melts the adhesive between the fabric layers and causes the adhesive bridges to flow and spread between the layers of fabric.

These two statements clearly show that the presently claimed nonwoven fabric, with bridges of adhesive, exists as a separate intermediate product – and shows that the adhesive bridges are still between the yarns of the fabric before any further processing is conducted, for example, in the flat bed laminator. Moreover, this statement implies that the flat bed laminator leaves, at least partially intact, the claimed bridges of adhesive between the warp yarns while also melting these bridges somewhat, so that they flow and spread (e.g., to the weft yarns). Nothing in the Examiner's question regarding the bridges refutes this point. The bridges are present, between the fabric layers – making this product both novel and unobvious compared to the products defined by the cited prior art, either considered individually or in any of the combinations proposed by the Examiner.

Given that the pending claims cover a product that exists – the product, and the claimed directed thereto are entitled to patent protection. Nothing in the claim language requires melting of the adhesive. The rejection should be reversed.

**Specific Individual Claim Arguments:**

**Claim 158:**

As set forth above, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Instead, Harwood provides for random breaks of adhesive on given threads, but further provides that the cross threads will seldom engage adhesive-free areas on adjacent length-wise threads. Without the use of the applique, Harwood's product would not be stable. Given that the cited art fails to teach every element recited in this Independent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 159:**

This dependent claim adds the further detail to Claim 158 the adhesive is on only one side of the first yarns. Again, Harwood fails to teach all of the elements recited. Even though Harwood shows adhesive breaks on one side of yarns, there are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 160:**

This dependent claim adds the further detail to Claim 159 that the substantially parallel first yarns in the first layer are held together to form a sheet by the bridges of the adhesive which prevent twisting of the individual first yarns in the first layer. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art which, as recited here, prevent

twisting of the first layer of yarns. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 164:**

This dependent claim adds the further detail to Claims 158-163 that the first yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 165:**

This dependent claim adds the further detail to Claim 164, wherein the polymer fibers are selected from the group consisting of polyester, polyethylene, rayon, polypropylene and nylon fibers. Claim 164 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 169:**

This dependent claim adds the further detail to Claims 158-163, wherein the substantially parallel first yarns have been formed in a warp-direction and supported and

bonded on only one side by the adhesive. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 170:**

This dependent claim adds the further detail to Claim 169, wherein the adhesive has been applied to the first yarns by dip/nip saturation, spraying, gravure coating, or kiss coating. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 171:**

This dependent claim adds the further detail to Claim 170, wherein the adhesive has a thickness of about 0.25 mil to about 1 mil. Claim 170 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 172:**

This dependent claim adds the further detail to Claim 170, wherein the adhesive is a heat activatable adhesive. Claim 170 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 173:**

This dependent claim adds the further detail to Claim 172, wherein the adhesive is a hot melt adhesive. Claim 172 depends from Claim 170, which depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 178:**

This dependent claim adds the further detail to Claim 169, wherein the adhesive has been applied to the first yarns by dip/nip saturation, spraying, gravure coating, or kiss coating. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.



**Claim 179:**

This dependent claim adds the further detail to Claim 178, such that the second yarns extend at an angle of about 85 to about 89.7 degrees relative to the first yarns. Claim 178 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 180:**

This dependent claim adds the further detail to Claims 158-163, wherein the first yarns are equally spaced apart and the second yarns are equally spaced apart. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 186:**

This dependent claim adds the further detail to Claim 164, such that the second yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite. Claim 164 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails

to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 193:**

This dependent claim adds the further detail to Claim 169, wherein the second yarns have been formed in a weft-direction and a side of the second yarns are supported by, and adhered to, the one side of the first yarns by the adhesive, applied to only the one side of the first yarns. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 197:**

This dependent claim adds the further detail to Claim 193, wherein the denier of all the first yarns is the same and the denier of all the second yarns is the same. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

**Claim 198:**

This dependent claim adds the further detail to Claim 193, wherein the denier of the first yarns is different from the denier of the second yarns. Claim 193 depends from

Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, Harwood fails to teach all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach every element recited in this dependent claim, the Section 102 rejection must be reversed. Such action is respectfully requested.

For the foregoing reasons, Appellant respectfully submits that reversal of the Section 102(b) rejection of Claims 158 -160, 164, 165, 169, 170-173, 178-180, 186, 193, 197, and 198 is proper.

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**Rejection No. 3:**

**Section 103(a) rejection over U.S. 3,591,434 with U.S. 5,342,469:**

Claims 158-167, 169-189, and 192-199 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hartstein (U.S. 3,591,434) in view of Bodford et al. (U.S. 5,342,469). Reversal of this rejection is respectfully requested.

The following comments apply to each of the rejected claims, which are further argued individually below. Appellant respectfully submits that these claims are NOT to be considered as a group herein, and that each claim is patentable individually for the reasons set forth here an as set forth below. Accordingly, the following comments relate to each of the rejected claims, but are provided here once for the Board's consideration. Appellant further argues each claim separately, below. Accordingly, each claim must be considered on its own merits.

**General arguments against the Section 103(a) rejection of each of the claims**

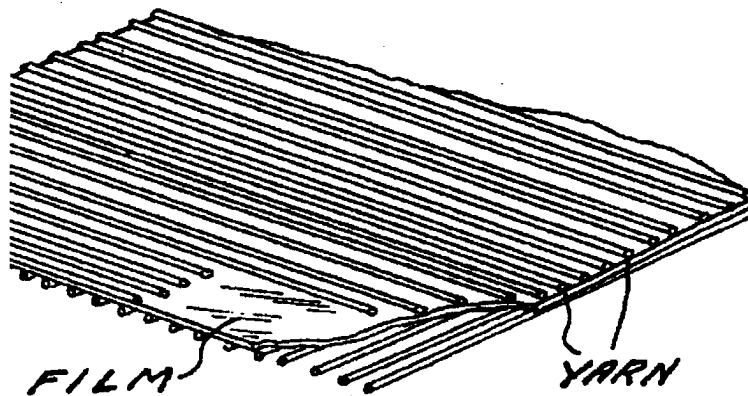
The proposed combination of Hartstein and Bodford does not make any of the rejected claims obvious, for the following reasons:

The rejection implies that the bridges as claimed are formed between the first and second layers. This is incorrect, as Claim 158 makes it clear that the bridges claimed herein are between parallel yarns **of the first layer** – not between yarns of the first and second layers. Accordingly, this proposed combination of art does not make the claimed invention obvious.

Moreover, Claim 158 requires that the adhesive layer not be uniform – it is both “discontinuous” (i.e., it is “non-uniform”) and it forms random bridges between substantially parallel yarns of the first layer.

Hartstein clearly teaches a set of parallel yarns that are bonded to one side of a self-supporting, discrete thermoplastic film, thereby forming a uni-axial laminate. A second set of parallel yarns are cross-laid to the uniaxial laminate on the other side of the thermoplastic film, forming a sandwich – a bi-axial laminated non-woven fabric. This is best illustrated in Figure 7, shown below:

*Fig. 7.*



Nothing in Hartstein teaches or suggests the bridges claimed herein, which are randomly formed to connect parallel yarns of the first layer.

Bodford teaches combining two substrates (12, 14) by an adhesive structure (20) formed of an array of substantially linear filaments or strands of adhesive. These linear

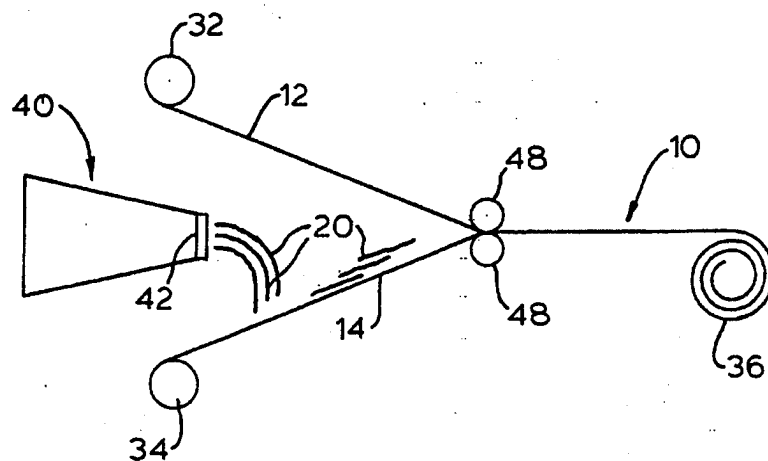
strands are discontinuous, but not random in orientation – as they are substantially unbroken and uncrossed. Nothing in Bodford teaches or suggests the bridges claimed herein, which are randomly formed to connect parallel yarns of the first layer.

Moreover, while Bodford states that the adhesive is “discontinuous” – the teachings of the specification define a nearly uniform adhesive structure – with substantially unbroken linear filaments, having uniform diameter, with only incidental overlap, resulting in a layer having substantially uniform thickness. See Col. 3, line 60 to Col. 4, line 20, reproduced here:

A critical feature of the present invention is that the adhesive structure 20 disposed intermediate the first and second substrate 12, 14 for securing them together to form the composite is both discontinuous and capable of forming the composite 10 without significantly modifying the properties of either of the first and second substrates 12, 14. This is achieved by the adhesive structure 20 being formed of an array of substantially linear filaments or strands of adhesive. The substantial linear filaments are preferably 3-100 microns (optimally 5-30 microns) in diameter and are typically formed by passage through a die (for example, the die of a spinneret) so that the filaments emerge unbroken and substantially linearly (i.e., uncrossed) from the apertures of the die. Incidental transient air currents impinging upon the linear filaments before they contact a substrate may result in some overlapping of the linear filaments as they are laid down upon the substrate; accordingly, the filaments are best described as only being "substantially linear" rather than totally linear. The adhesive structure 20 may be defined by continuous filaments, non-continuous filaments or a mixture of both as the continuous filaments emerging from the die may be broken by incidental transient air currents or the like. The filaments are commonly, but not necessarily, circular in cross section. The adhesive structure 20 is of substantially

uniform thickness, typically equal to the diameter of the adhesive filaments since there is essentially only a single layer of filaments intermediate the substrates 12, 14.

This "critical feature" (20 = parallel lines) is best illustrated in Figure 3, shown here:



**FIG. 3**

Clearly the teaching of Bodford fails to make up the deficiencies of the primary reference. Bodford merely discloses a process of making a laminate (called a "composite") by applying a parallel array 20 of strands of adhesive between a non-woven substrate 12 and a continuous plastic film 14 --- not between warp-direction and weft-direction yarns.

Also, Appellant submits that the proposed combination of Hartstein and Bodford is simply not logical. Hartstein uses a uniform material - a self-supporting, discrete

thermoplastic film – as the adhesive for his composite sandwich of substrate materials. In contrast thereto, Bodford deposits an array 20 of parallel strands of adhesive between two substrates 12 and 14 – in order to form his composite sandwich of substrate materials.

Why would the skilled artisan combine these two references? Hartstein makes one type of product and Bodford makes another type of product. The teachings are simply not combinable as suggested. Given this, the proposed Section 103(a) rejection is simply not valid, and the rejected claims are not obvious over the combined teachings of the cited art.

In the Advisory Action, the Examiner admits that the presently claimed invention is “a composite structure having a first of parallel yarns and a second set of parallel yarns, the two sets of yarns run perpendicular to each other, with a discontinuous layer of adhesive between the two layers.” This is correct – and the prior art cited against this invention does not teach or make obvious the claimed invention.

The Examiner’s comments regarding what happens to the bridges upon heating (e.g., “the bridges will melt and form bonds between the two sets of parallel yarns”) are irrelevant to the patentability of the claimed invention – which recites NOTHING about heating. The bridges are, at the very least, a feature of an **intermediate product** – which the present inventors are entitled to claim. Support for this product is found in the specification as filed:

In Paragraph No. [0188], the specification provides the following information:



If desired, the bond between the warp yarns and weft yarns can be made more intimate, for example by heating and cooling the product under pressure, e.g., by a lamination apparatus.

In Paragraph No. [0205], the specification teaches that the presently claimed composite fabric, formed by the XD machine, is subsequently fed to a flat bed laminator – which is where the adhesive is further melted and the crossed-yarns are pressed together:

The heating zone melts the adhesive between the fabric layers and causes the adhesive bridges to flow and spread between the layers of fabric.

These two statements clearly show that the presently claimed nonwoven fabric, with bridges of adhesive, exists as a separate intermediate product – and shows that the adhesive bridges are still between the yarns of the fabric before any further processing is conducted, for example, in the flat bed laminator. Moreover, this statement implies that the flat bed laminator leaves, at least partially intact, the claimed bridges of adhesive between the warp yarns while also melting these bridges somewhat, so that they flow and spread (e.g., to the weft yarns). Nothing in the Examiner's question regarding the bridges refutes this point. The bridges are present, between the fabric layers – making this product both novel and unobvious compared to the products defined by the cited prior art, either considered individually or in any of the combinations proposed by the Examiner.

Given that the pending claims cover a product that exists – the product, and the claimed directed thereto are entitled to patent protection. Nothing in the claim language requires melting of the adhesive. The rejection should be reversed.

**Specific Individual Claim Arguments:**

**Claim 158:**

This Independent claim is neither taught nor suggested by the proposed combination of art. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 159:**

This dependent claim adds the further detail to Claim 158 the adhesive is on only one side of the first yarns. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 160:**

This dependent claim adds the further detail to Claim 159 that the substantially parallel first yarns in the first layer are held together to form a sheet by the bridges of the adhesive which prevent twisting of the individual first yarns in the first layer. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 164:**

This dependent claim adds the further detail to Claims 158-163 that the first yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 169:**

This dependent claim adds the further detail to Claims 158-163, wherein the substantially parallel first yarns have been formed in a warp-direction and supported and bonded on only one side by the adhesive. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 170:**

This dependent claim adds the further detail to Claim 169, wherein the adhesive has been applied to the first yarns by dip/nip saturation, spraying, gravure coating, or kiss coating. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between

parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 178:**

This dependent claim adds the further detail to Claim 169, wherein the adhesive has been applied to the first yarns by dip/nip saturation, spraying, gravure coating, or kiss coating. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 179:**

This dependent claim adds the further detail to Claim 178, such that the second yarns extend at an angle of about 85 to about 89.7 degrees relative to the first yarns. Claim 178 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 180:**

This dependent claim adds the further detail to Claims 158-163, wherein the first yarns are equally spaced apart and the second yarns are equally spaced apart. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 186:**

This dependent claim adds the further detail to Claim 164, such that the second yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 193:**

This dependent claim adds the further detail to Claim 169, wherein the second yarns have been formed in a weft-direction and a side of the second yarns are supported by, and adhered to, the one side of the first yarns by the adhesive, applied to only the one side of the first yarns. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 194:**

This dependent claim adds the further detail to Claim 193 which has a weft-direction strength equal to its warp-direction strength. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 195:**

This dependent claim adds the further detail to Claim 193, wherein the denier of all the first and second yarns is approximately the same. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 196:**

This dependent claim adds the further detail to Claim 193, wherein the denier of some of the first yarns is different and/or the denier of some of the second yarns is different. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone

or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 197:**

This dependent claim adds the further detail to Claim 193, wherein the denier of all the first yarns is the same and the denier of all the second yarns is the same. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 198:**

This dependent claim adds the further detail to Claim 193, wherein the denier of the first yarns is different from the denier of the second yarns. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

**Claim 199:**

This dependent claim adds the further detail to Claim 193, wherein some of the second yarns are of a smaller denier than the first yarns. Claim 193 depends from Claim 169. Claim 169 depends from Claims 158-163 and includes all of the limitations thereof. Again, the cited art, either considered alone or in combination, fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught or suggested by either reference, or the combined teachings thereof. Accordingly, the Section 103(a) rejection should be reversed. Such action is respectfully requested.

For the foregoing reasons, Appellant respectfully submits that reversal of the Section 103(a) rejection of Claims 158 -160, 164, 169, 170, 178-180, 186, and 193-199 is proper.

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**Rejection No. 4:**

**Section 103(a) rejection over U.S. 3,591,434 with U.S. 5,342,469 and U.S. 3,753,842:**

Claims 168, 190 and 191 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Hartstein (U.S. 3,591,434) in view of Bodford et al. (U.S. 5,342,469) and further in view of Pittman (U.S. 3,753,842). Reversal of this rejection is respectfully requested.

The following comments apply to each of the rejected claims, which are further argued individually below. Appellant respectfully submits that these claims are NOT to be considered as a group herein, and that each claim is patentable individually for the reasons set forth here an as set forth below. Accordingly, the following comments relate to each of the rejected claims, but are provided here once for the Board's consideration. Appellant further argues each claim separately, below. Accordingly, each claim must be considered on its own merits.

**General arguments against the Section 103(a) rejection of each of the claims:**

The proposed combination of Hartstein, Bodford, and Pittman does not make Claims 169, 190 and 191 obvious, for the following reasons:

Hartstein and Bodford have been distinguished above. They teach nothing about the random, discontinuous bridges of adhesive claimed herein which hold the first layer of parallel yarns together. Hartstein has a self-supporting thermoplastic film as his adhesive. Bodford uses an array of substantially linear filaments or strands of adhesive.

Pittman discloses a nonwoven fabric made by adhering overlying warp yarns to weft yarns with an adhesive. However, Pittman's adhesive is applied to his yarns by "dipping" the yarns or fabric in the adhesive or by "padding or spraying" the adhesive on the yarns or fabric to "coat" the yarns. See column 3, lines 2-12 and column 8, lines 2-15 of Pittman, repeated here:

The adhesive composition of the present invention may be applied to the yarns prior to formation of the fabric, or the adhesive may be applied to the fabric after the yarns have been oriented in the desired manner. The application of the adhesive can be accomplished by dipping the yarn or fabric in an emulsion or solution of the adhesive, preferably an aqueous emulsion of the adhesive, and thereafter squeezing the yarn or fabric to remove excess liquid and evenly distribute the adhesive on the yarn or fabric. Other techniques known in the art for applying liquids to fibers such as by padding or spraying can also be employed. The amount of adhesive composition incorporated into the fabric can vary over a wide range depending upon the nature of the yarn, the nature of the adhesive composition, and the end use contemplated for the fabric. For example, where a stiff fabric is desirable, increased amounts of adhesive may be applied to the fabric without detracting from its utility whereas lesser amounts of adhesive or an additional plasticizer generally may be required if the desired product is to be soft and flexible.

The adhesive compositions of this invention have been found to be useful particularly in the preparation of non-woven textile fabrics, especially fabrics comprised of yarns composed of synthetic materials such as polyesters, polyethers and regenerated cellulose. The non-woven fabrics can be obtained by heat treating a non-woven fabric wherein the yarns have been coated with the adhesive composition of the invention. Coating of the yarns can be accomplished

either by passing the yarns through an emulsion of the adhesive prior to formation of the fabric structure, or the fabric structure can be prepared and thereafter conveyed through an emulsion of the adhesive.

The structure and orientation of the yarns and fibers of the non-woven textile fabrics of this invention may be obtained by any of the processes known in the art. Although the adhesive compositions of this invention are useful for bonding non-woven fiber and filament products having a well defined oriented structure or fibrous mats in which the fibers or filaments are distributed haphazardly or in a random array, the adhesive is particularly useful for bonding textile fabric structures wherein the yarns are arranged in an, oriented pattern and bonded together at their crossing points., For example, as shown in FIG. 1, a layer of parallel fill yarns 10 is contacted with a layer of parallel warp, yarns 11, the warp and fill yarns intersecting at right angles. In FIG. 2, the warp and fill yarns of a fabric may be arranged so that the fill yarns 10 are substantially parallel to each other although the warp yarns 11 are substantially parallel to each other although the warp yarns and fill yarns do not intersect at right angles.

Clearly, nothing in Pittman remedies the deficiencies of Hartstein and Bodford. The proposed combination of art simply fails to make a prima facie case of obviousness against Claims 168, 190 and 191.

In the Advisory Action, the Examiner admits that the presently claimed invention is "a composite structure having a first of parallel yarns and a second set of parallel yarns, the two sets of yarns run perpendicular to each other, with a discontinuous layer of adhesive between the two layers." This is correct – and the prior art cited against this invention does not teach or make obvious the claimed invention.

The Examiner's comments regarding what happens to the bridges upon heating (e.g., "the bridges will melt and form bonds between the two sets of parallel yarns") are irrelevant to the patentability of the claimed invention – which recites NOTHING about heating. The bridges are, at the very least, a feature of an **intermediate product** – which the present inventors are entitled to claim. Support for this product is found in the specification as filed:

In Paragraph No. [0188], the specification provides the following information:

If desired, the bond between the warp yarns and weft yarns can be made more intimate, for example by heating and cooling the product under pressure, e.g., by a lamination apparatus.

In Paragraph No. [0205], the specification teaches that the presently claimed composite fabric, formed by the XD machine, is subsequently fed to a flat bed laminator – which is where the adhesive is further melted and the crossed-yarns are pressed together:

The heating zone melts the adhesive between the fabric layers and causes the adhesive bridges to flow and spread between the layers of fabric.

These two statements clearly show that the presently claimed nonwoven fabric, with bridges of adhesive, exists as a separate intermediate product – and shows that the adhesive bridges are still between the yarns of the fabric before any further processing is conducted, for example, in the flat bed laminator. Moreover, this statement implies that the flat bed laminator leaves, at least partially intact, the claimed bridges of adhesive between the warp yarns while also melting these bridges somewhat, so that they flow and

spread (e.g., to the weft yarns). Nothing in the Examiner's question regarding the bridges refutes this point. The bridges are present, between the fabric layers – making this product both novel and unobvious compared to the products defined by the cited prior art, either considered individually or in any of the combinations proposed by the Examiner.

Given that the pending claims cover a product that exists – the product, and the claimed directed thereto are entitled to patent protection. Nothing in the claim language requires melting of the adhesive. The rejection should be reversed.

**Specific Individual Claim Arguments:**

**Claim 168:**

This dependent claim adds the following detail to Claim 164, namely that one or more of the first yarns are glass fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. Given that Claim 168 depends indirectly from Independent Claim 158, it is clear that the combined cited art fails to either teach or suggest the invention defined herein. There are no random bridges of adhesive between parallel first yarns taught or suggested by any single reference, or the combined teachings thereof.

**Claim 190:**

This dependent claim adds the following detail to Claim 186, namely that one or more of the second yarns are glass fibers. Claim 186 depends from Claim 164, discussed above, which provides that one or more of the first yarns are glass fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected

from a Markush group, which includes glass fibers. Given that Claim 190 depends indirectly from Independent Claim 158, it is clear that the combined cited art fails to either teach or suggest the invention defined herein. There are no random bridges of adhesive between parallel first yarns taught or suggested by any single reference, or the combined teachings thereof.

**Claim 191:**

This dependent claim adds the following detail to Claim 186, namely that one or more of the first yarns are spun polyester yarns. Claim 186 depends from Claim 164, discussed above, which provides that one or more of the first yarns are glass fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. Given that Claim 190 depends indirectly from Independent Claim 158, it is clear that the combined cited art fails to either teach or suggest the invention defined herein. There are no random bridges of adhesive between parallel first yarns taught or suggested by any single reference, or the combined teachings thereof.

Accordingly, the Section 103(a) rejection of Claims 168, 190 and 191 should be reversed. Such action is respectfully requested.

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**Rejection No. 5:**

**Section 103(a) rejection over U.S. 3,582,443:**

Claims 161-163, 165-168, 171-174, 176, 177, 181-185 and 187-192 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Bascom (U.S. 3,582,443). Reversal of this rejection is respectfully requested.

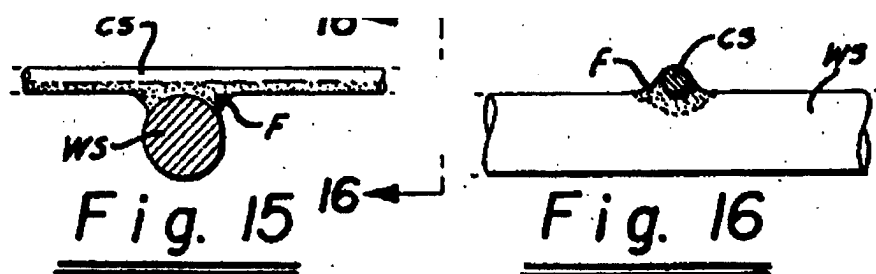
The following comments apply to each of the rejected claims, which are further argued individually below. Appellant respectfully submits that these claims are NOT to be considered as a group herein, and that each claim is patentable individually for the reasons set forth here an as set forth below. Accordingly, the following comments relate to each of the rejected claims, but are provided here once for the Board's consideration. Appellant further argues each claim separately, below. Accordingly, each claim must be considered on its own merits.

**General arguments against the Section 103(a) rejection of each of the claims:**

Bascom does not make the rejected claims obvious, because Bascom neither teaches nor suggests the claimed non-uniform, i.e., discontinuous, random bridges of adhesive applied to the first layer of yarns, as recited in Claim 158, which also carries through to the claims that depend either directly or indirectly with Claim 158.

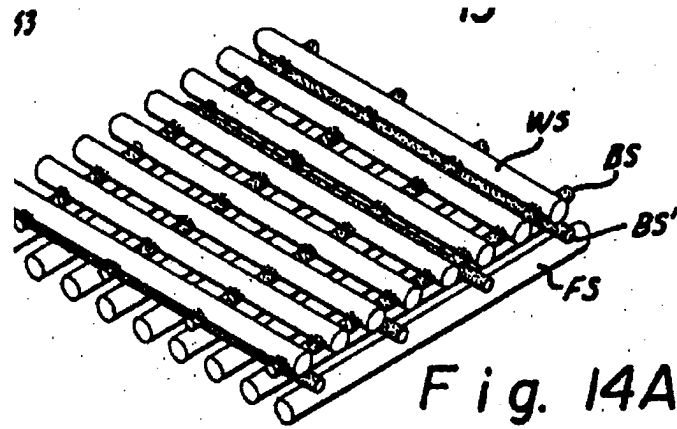
Instead, Bascom teaches a "continuous" or uniform adhesive coating, applied to either one set of the perpendicular yarn sets, or to both yarn sets. More particularly, Bascom discloses a process of making non-woven fabrics by applying adhesive essentially only between warp-direction fibers (WS) and weft-direction fibers (CS). See Column 7, lines 32-41 and Column 9, lines 57-61, reproduced here:

As discussed above, only that adhesive is used which is needed to develop a strong filleted bond between the warp and cross strands, and this is illustrated in FIGS. 15 and 16. In FIGS. 15 and 16 the warp strand WS is of somewhat larger diameter than the cross strand CS. However, and as will be described in further detail below, same size strands may be used in those instances where it is desired to develop a bi-directional fabric having a mini- 40 mum of bonds but very high adhesion between layers.



In FIG. 14A a four layer product is shown which comprises two main layers of warp strands WS and fill strands FS disposed an angle to one another and joined by two layers of binder strands BS and BS' which are adhesively coated and bonded to one another. The strands in the binder strand layers are widely spaced and of small diameter, and the strands of the two main layers are free of adhesive except for the junctions with the binder strands. As a result, the handling characteristics of the completed fabric is substantially independent of the adhesive so that the woven fabric exhibits hand and drape characteristics of a natural fiber, woven fabric.





The processes described by Bascom requires highly controlled application of adhesive to selected individual warp strands and/or selected individual cross strands, with other of the warp and cross strands remaining free of adhesive. See Claim 1.

Since nothing is taught or suggested about bridges that randomly contact and link parallel yarns of the first layer of parallel yarns, as claimed herein, Bascom fails to make the rejected claims obvious.

In the Advisory Action, the Examiner admits that the presently claimed invention is “a composite structure having a first of parallel yarns and a second set of parallel yarns, the two sets of yarns run perpendicular to each other, with a discontinuous layer of adhesive between the two layers.” This is correct – and the prior art cited against this invention does not teach or make obvious the claimed invention.

The Examiner’s comments regarding what happens to the bridges upon heating (e.g., “the bridges will melt and form bonds between the two sets of parallel yarns”) are irrelevant to the patentability of the claimed invention – which recites NOTHING about heating. The bridges are, at the very least, a feature of an **intermediate product** – which

the present inventors are entitled to claim. Support for this product is found in the specification as filed:

In Paragraph No. [0188], the specification provides the following information:

If desired, the bond between the warp yarns and weft yarns can be made more intimate, for example by heating and cooling the product under pressure, e.g., by a lamination apparatus.

In Paragraph No. [0205], the specification teaches that the presently claimed composite fabric, formed by the XD machine, is subsequently fed to a flat bed laminator – which is where the adhesive is further melted and the crossed-yarns are pressed together:

The heating zone melts the adhesive between the fabric layers and causes the adhesive bridges to flow and spread between the layers of fabric.

These two statements clearly show that the presently claimed nonwoven fabric, with bridges of adhesive, exists as a separate intermediate product – and shows that the adhesive bridges are still between the yarns of the fabric before any further processing is conducted, for example, in the flat bed laminator. Moreover, this statement implies that the flat bed laminator leaves, at least partially intact, the claimed bridges of adhesive between the warp yarns while also melting these bridges somewhat, so that they flow and spread (e.g., to the weft yarns). Nothing in the Examiner's question regarding the bridges refutes this point. The bridges are present, between the fabric layers – making this product both novel and unobvious compared to the products defined by the cited

prior art, either considered individually or in any of the combinations proposed by the Examiner.

Given that the pending claims cover a product that exists – the product, and the claimed directed thereto are entitled to patent protection. Nothing in the claim language requires melting of the adhesive. The rejection should be reversed.

**Specific Individual Claim Arguments:**

**Claim 161:**

This dependent claim adds the further detail to Claim 159, wherein the adhesive is on the one side of the first yarns at a level of from about 5 weight percent to about 25 weight percent, based upon the total weight of the sheet of the first yarns. Clearly the totality of this claim is neither taught nor suggested by the cited prior art. Moreover, there are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 162:**

This dependent claim adds the further detail to Claim 161, wherein the total weight of the sheet of the first yarns is about 50 g/m<sup>2</sup> and the adhesive weight is about 2 to 15 g/m<sup>2</sup>. Claim 161 depends from Claims 159 and 158. Clearly the totality of this claim is neither taught nor suggested by the cited prior art. Moreover, there are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 163:**

This dependent claim adds the further detail to Claim 161, wherein the total weight of the sheet of the first yarns is about  $50 \text{ g/m}^2$  and the adhesive weight is about 5 to  $10 \text{ g/m}^2$ . Claim 161 depends from Claims 159 and 158. Clearly the totality of this claim is neither taught nor suggested by the cited prior art. Moreover, there are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 165:**

This dependent claim adds the further detail to Claim 164, wherein the polymer fibers are selected from the group consisting of polyester, polyethylene, rayon, polypropylene and nylon fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. Again, Bascom fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 166:**

This dependent claim adds the further detail to Claim 164, wherein the natural fibers are selected from the group consisting of cotton fibers and wool fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. The totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive

between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 167:**

This dependent claim adds the further detail to Claim 164, wherein the metal fibers are selected from the group consisting of copper, gold, aluminum, silver and platinum. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. The totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 168:**

This dependent claim adds the following detail to Claim 164, namely that one or more of the first yarns are glass fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. Given that Claim 168 depends indirectly from Independent Claim 158, it is clear that the combined cited art fails to either teach or suggest the invention defined herein. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 171:**

This dependent claim adds the further detail to claim 170, wherein the adhesive has a thickness of about 0.25 mil to about 1 mil. Claim 170 depends from Claim 169, which depends from Claims 158-163, and includes all of the limitations thereof. The totality of this claim is neither taught nor suggested by the cited prior art. Again, Bascom fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 172:**

This dependent claim adds the further detail to claim 170, wherein the adhesive is a heat activatable adhesive. Claim 170 depends from Claim 169, which depends from Claims 158-163, and includes all of the limitations thereof. The totality of this claim is neither taught nor suggested by the cited prior art. Again, Bascom fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 173:**

This dependent claim adds the further detail to claim 172, wherein the adhesive is a hot melt adhesive. This claim depends from Claim 172, which depends from Claim 170, which depends from Claim 169, which depends from Claims 158-163, and includes all of the limitations thereof. The totality of this claim is neither taught nor suggested by the cited prior art. Again, Bascom fails to teach or suggest all of the elements recited.

There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 174:**

This dependent claim adds the further detail to Claim 173, wherein the adhesive is a hot melt copolyester polymer. This claim depends from Claim 172, which depends from Claim 170. Claim 170 depends from Claim 169, which depends from Claims 158-163, and includes all of the limitations thereof. The totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 176:**

This dependent claim adds the further detail to Claims 158-163, wherein the adhesive is from about 5 to 20 percent by weight of the total weight of the fabric. The totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 177:**

This dependent claim adds the further detail to Claim 176, wherein the adhesive is from about 10 to 15 percent by weight of the total weight of the fabric. Claim 176 depends from Claims 158-163, and includes all of the limitations thereof. The totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 181:**

This dependent claim adds the further detail to Claims 158-163, wherein the first layer and/or the second layer has a density of at least 40 yarns per inch in a transverse direction of the yarns. The totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 182:**

This dependent claim adds the further detail to Claim 181, wherein the first layer and/or the second layer has a density of between 40 and 140 yarns per inch in a transverse direction of the yarns. Claim 181 depends from Claims 158-163 and includes all of the limitations thereof. Accordingly, the totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.



**Claim 183:**

This dependent claim adds the further detail to Claim 182, wherein the first layer and/or the second layer has a density of between 60 and 100 yarns per inch in a transverse direction of the yarns. Claim 182 depends from Claim 181. Claim 181 depends from Claims 158-163 and includes all of the limitations thereof. Accordingly, the totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 184:**

This dependent claim adds the further detail to Claim 183, wherein the first layer has a density of 40 to 90 yarns per inch of 30/1 to 36/1 count yarn. Claim 183 depends from Claim 182, which depends from Claim 181. Claim 181 depends from Claims 158-163 and includes all of the limitations thereof. Accordingly, the totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 185:**

This dependent claim adds the further detail to Claim 183, wherein the second layer has a density of 90 to 140 yarns per inch of 36/1 count yarn. Claim 183 depends from Claim 182, which depends from Claim 181. Claim 181 depends from Claims 158-

163 and includes all of the limitations thereof. Accordingly, the totality of this claim is neither taught nor suggested by the cited prior art. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 187:**

This dependent claim adds the further detail to Claim 186, wherein the polymer fibers are selected from the group consisting of polyester, polyethylene, rayon, polypropylene and nylon fibers. Claim 186 depends from Claim 164. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. Again, Bascom fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 188:**

This dependent claim adds the further detail to Claim 186, wherein the natural fibers are selected from the group consisting of cotton fibers and wool fibers. Claim 186 depends from Claim 164. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. Again, Bascom fails to teach or suggest all of the elements recited. There are no random bridges of adhesive between parallel first yarns taught in the cited art. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 189:**

This dependent claim adds the following detail to Claim 186, namely that one or more of the second yarns are glass fibers. Claim 186 depends from Claim 164, discussed above, which provides that one or more of the first yarns are glass fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 191:**

This dependent claim adds the following detail to Claim 186, namely that one or more of the first yarns are spun polyester yarns. Claim 186 depends from Claim 164, discussed above, which provides that one or more of the first yarns are glass fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are selected from a Markush group, which includes glass fibers. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

**Claim 192:**

This dependent claim adds the following detail to Claim 186, namely that one or more of the second yarns are single strand cotton yarns. Claim 186 depends from Claim 164, discussed above, which provides that one or more of the first yarns are glass fibers. Claim 164 depends from Claims 158-163, and provides the feature that the first yarns are

selected from a Markush group, which includes glass fibers. There are no random bridges of adhesive between parallel first yarns taught or suggested by Bascom. Given that Claim 191 depends indirectly from Independent Claim 158, it is clear that the combined cited art fails to either teach or suggest the invention defined herein. Given that the cited art fails to teach or suggest every element recited in this dependent claim, the Section 103 rejection must be reversed. Such action is respectfully requested.

For the foregoing reasons, Appellant respectfully submits that reversal of the Section 103(a) rejection of Claims 161-163, 165-168, 171-174, 176, 177, 181-185 and 187-192 is proper.

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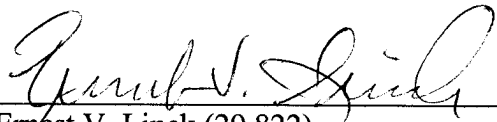
**Conclusion:**

For the reasons set forth above, Appellant respectfully requests that the Board reverse the Examiner in this application.

**FEE AUTHORIZATION**

Please charge all fees due in connection with this filing to our Deposit Account – No. 19-0733.

Respectfully submitted,



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Date: 27 March 2006

**(viii) Claims appendix (clean copy, double spaced):**

158. A nonwoven fabric comprising:

a first layer of substantially parallel first yarns; and

a second layer of substantially parallel second yarns;

the first and second yarns being substantially perpendicular to one another and the first and second layers being adhered together with an adhesive, wherein:

(a) the adhesive is applied to one side of the first layer of substantially parallel yarns in a discontinuous manner;

(b) the adhesive forms random bridges between substantially parallel yarns of the first layer; and

(c) the adhesive is located substantially only between the first and second layers of the adhered together substantially perpendicular yarns.

159. The nonwoven fabric of claim 158, wherein the adhesive is on only one side of the first yarns.

160. The nonwoven fabric of claim 159, wherein the substantially parallel first yarns in the first layer are held together to form a sheet by the bridges of the adhesive which prevent twisting of the individual first yarns in the first layer.

161. The nonwoven fabric of claim 159, wherein the adhesive is on the one side of the first yarns at a level of from about 5 weight percent to about 25 weight percent, based upon the total weight of the sheet of the first yarns.

162. The nonwoven fabric of claim 161, wherein the total weight of the sheet of the first yarns is about  $50 \text{ g/m}^2$  and the adhesive weight is about 2 to  $15 \text{ g/m}^2$ .

163. The nonwoven fabric of claim 161, wherein the total weight of the sheet of the first yarns is about  $50 \text{ g/m}^2$  and the adhesive weight is about 5 to  $10 \text{ g/m}^2$ .

164. The nonwoven fabric of any one of claims 158-163, wherein the first yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite.

165. The nonwoven fabric of claim 164, wherein the polymer fibers are selected from the group consisting of polyester, polyethylene, rayon, polypropylene and nylon fibers.

166. The nonwoven fabric of claim 164, wherein the natural fibers are selected from the group consisting of cotton fibers and wool fibers.

167. The nonwoven fabric of claim 164, wherein the metal fibers are selected from the group consisting of copper, gold, aluminum, silver and platinum.

168. The nonwoven fabric of claim 164, wherein one or more of the first yarns are glass fibers.

169. The nonwoven fabric of any one of claims 158-163, wherein the substantially parallel first yarns have been formed in a warp-direction and supported and bonded on only one side by the adhesive.

170. The nonwoven fabric of claim 169, wherein the adhesive has been applied to the first yarns by dip/nip saturation, spraying, gravure coating, or kiss coating.

171. The nonwoven fabric of claim 170, wherein the adhesive has a thickness of about 0.25 mil to about 1 mil.

172. The nonwoven fabric of claim 170, wherein the adhesive is a heat activatable adhesive.

173. The nonwoven fabric of claim 172, wherein the adhesive is a hot melt adhesive.



174. The nonwoven fabric of claim 173, wherein the adhesive is a hot melt copolyester polymer.

175. The nonwoven fabric of claim 170, wherein the adhesive is a scrim or lace web of adhesive or a meltblown adhesive.

176. The nonwoven fabric of any one of claims 158-163, wherein the adhesive is from about 5 to 20 percent by weight of the total weight of the fabric.

177. The nonwoven fabric of claim 176, wherein the adhesive is from about 10 to 15 percent by weight of the total weight of the fabric.

178. The nonwoven fabric of any one of claims 158-163, wherein the second yarns extend at an angle of about 80 degrees to about 89.7 degrees relative to the first yarns.

179. The nonwoven fabric of claim 178, wherein the second yarns extend at an angle of about 85 to about 89.7 degrees relative to the first yarns.

180. The nonwoven fabric of any one of claims 158-163, wherein the first yarns are equally spaced apart and the second yarns are equally spaced apart.

181. The nonwoven fabric of any one of claims 158-163, wherein the first layer and/or the second layer has a density of at least 40 yarns per inch in a transverse direction of the yarns.

182. The nonwoven fabric of claim 181, wherein the first layer and/or the second layer has a density of between 40 and 140 yarns per inch in a transverse direction of the yarns.

183. The nonwoven fabric of claim 182, wherein the first layer and/or the second layer has a density of between 60 and 100 yarns per inch in a transverse direction of the yarns.

184. The nonwoven fabric of claim 183, wherein the first layer has a density of 40 to 90 yarns per inch of 30/1 to 36/1 count yarn.

185. The nonwoven fabric of claim 183, wherein the second layer has a density of 90 to 140 yarns per inch of 36/1 count yarn.

186. The nonwoven fabric of claim 164, wherein the second yarns are selected from the group consisting of polymer fibers, natural fibers, synthetic fibers, composite fibers, carbon fibers, glass fibers, metallic fibers and graphite.

187. The nonwoven fabric of claim 186, wherein the polymer fibers are selected from the group consisting of polyester, polyethylene, rayon, polypropylene and nylon fibers.

188. The nonwoven fabric of claim 186, wherein the natural fibers are selected from the group consisting of cotton fibers and wool fibers.

189. The nonwoven fabric of claim 186, wherein the metal fibers are independently selected from the group consisting of copper, gold, aluminum, silver and platinum.

190. The nonwoven fabric of claim 186, wherein one or more of the second yarns are glass fibers.

191. The nonwoven fabric of claim 186, wherein one or more of the first yarns are spun polyester yarns.

192. The nonwoven fabric of claim 186, wherein one or more of the second yarns are single strand cotton yarns.

193. The nonwoven fabric of claim 169, wherein the second yarns have been formed in a weft-direction and a side of the second yarns are supported by, and adhered to, the one side of the first yarns by the adhesive, applied to only the one side of the first yarns.

194. The nonwoven fabric of claim 193 which has a weft-direction strength equal to its warp-direction strength.

195. The nonwoven fabric of claim 193, wherein the denier of all the first and second yarns is approximately the same.

196. The nonwoven fabric of claim 193, wherein the denier of some of the first yarns is different and/or the denier of some of the second yarns is different.

197. The nonwoven fabric of claim 193, wherein the denier of all the first yarns is the same and the denier of all the second yarns is the same.

198. The nonwoven fabric of claim 193, wherein the denier of the first yarns is different from the denier of the second yarns.

199. The nonwoven fabric of claim 193, wherein some of the second yarns are of a smaller denier than the first yarns.

**(ix) Evidence appendix:**

Appellant believes that the prior art cited by the Examiner in support of the rejections need not be attached here, as these documents are already part of the record in this appeal.

Attached are color copies of Figures 61A and 61B which provide a better view of the adhesive bridges claimed herein.

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Color Fig. 61A:



Color Fig. 61B:





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**(x) Related proceedings index:**

None.